

Petr Stepanov

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Work Experience

Full-Stack Developer

[Sticker Store LLC](#), Portland, OR.

Feb 2023 - Current

Node.js Express.js Modular JavaScript

C++ Software Developer • Research Collaborator (On-Site)

[Thomas Jefferson National Laboratory \(JLab\)](#), Newport News, VA.

Jul 2020 - Jan 2023

CERN ROOT Geant4 High Energy Physics (HEP) High Performance Computing (HPC) C++ CMake

Postdoctoral Researcher • Software Developer (Remote)

[Catholic University of America \(CUA\)](#), Washington, DC.

Jul 2020 - Jan 2023

Python Fast-Fast BNC Electronics Scintillation Single Photon Counting

Software Developer • Research Assistant

[Bowling Green State University \(BGSU\)](#), Bowling Green, OH.

Aug 2014 - May 2020

Data Analysis Wolfram Mathematica C++ Makefiles e+ Annihilation Spectroscopy

Frontend Developer, UI/UX Designer • Freelance

Sep 2012 - May 2020

Full Stack Web Developer, Web Designer

[Gridnine Systems](#), Moscow, Russia.

Apr 2011 - Aug 2014

Computer Science Teacher

[Phys-Tech College at MIPT](#), Moscow, Russia.

Oct 2009 - May 2011

Research Scientist

[Institute for Theoretical and Experimental Physics \(ITEP\)](#), Moscow, Russia.

Sep 2008 - Apr 2011

Material Research Skills

- **Characterization facilities.** Positron Lifetime and Doppler Broadening Annihilation Spectroscopy (PALS, DBAR). Atom Probe Tomography (ATP). Scanning Electron Microscopy (SEM). Transmission electron microscopy (TEM). Atomic Force Microscopy (AFM). UV-VIS Spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR).
- **Material processing.** High-temperature annealing. Wet chemical etching. Electrical Contact Fabrication. Sample polishing.

Education

Bowling Green State University (BGSU) • OH, United States

Aug 2014 - May 2020

Ph.D. in Photochemical Sciences • GPA 3.423. [Dissertation](#): Novel developments in positron spectroscopy (PAS).

- Assembled and utilized two spectrometers: positron lifetime and Doppler. Spectrometers are built from ORTEC and Canberra (Mirion) fast electronic units and utilize High-Purity Germanium Detectors (HPGe) and scintillation-based detector systems.
- Developed open-source software (C++, CERN ROOT) for a novel interpretation of the experimental spectra.
- Defined and resolved kinetic equations of reactions of positron and positronium atoms (Ps) in solids and liquids and nano-powders (Wolfram Mathematica). Equation parameters are implemented in the fitting model of experimental spectra (RooFit).
- Above research allowed for the estimation of defect concentrations and sizes in solids, classification of defect types (vacancies, dislocations), and more...

Ohio Supercomputer Workshop • OH, USA

Jan 2017 - Feb 2017

Hands-on sessions in High-Performance Computing Infrastructure (HPC, SSH, BASH, SLURM).

British Higher School of Art and Design (BHSAD) • Moscow, Russia

Dec 2011 - Feb 2012

Three-month intensive in Graphical Design and Visual Communications (illustration, lettering, brand identity).

National Research Nuclear University (MEPhI) • Moscow, Russia

Sep 2004 - Feb 2011

B.S. and M.S. in Solid State Physics. Thesis: application of PAS for defect concentration studies in bulk materials.

Featured Publications

- P. S. Stepanov, F. A. Selim et al. Interaction of positronium with dissolved oxygen in liquids. *Physical Chemistry Chemical Physics* **2020**, 22 (9), 5123-5131. [10.1039/c9cp06105c](https://doi.org/10.1039/c9cp06105c).
- P. S. Stepanov, F. A. Selim et al. A model for joint processing of LT and CDB spectra of dielectric nano-sized powders. *AIP Conference Proceedings* 2182 **2019**. [10.1063/1.5135836](https://doi.org/10.1063/1.5135836).
- P.S. Stepanov, S.V. Stepanov et al. Developing New Routine for Processing Two-Dimensional Coincidence Doppler Energy Spectra and Evaluation of Electron Subsystem Properties in Metals. *Acta Physica Polonica A* **2017**, 132 (5), 1628-1633. [10.12693/aphyspola.132.1628](https://doi.org/10.12693/aphyspola.132.1628).

Conferences

18th International Conference on Positron Annihilation (ICPA-18)

Aug 2018

Orlando, FL, USA

Oral talk "Positions and Ps in Al₂O₃ Nanopowders"

International Workshop on Physics with Positrons (JPos17)

Sept 2017

JLab, Newport News, VA, USA

Poster "A routine of background subtraction from two-dimensional Doppler broadened spectra"

12th International Workshop on Positron and Positronium Chemistry (PPC12)

Sept 2017

Maria Curie-Sklodowska University, Lublin, Poland

Poster "Developing new routine for processing two-dimensional coincidence Doppler energy spectra"

Ohio Photochemical Society Meeting (Oops)

May 2017

Maumee Bay Lodge & Conference Center, Maumee, OH, USA

Poster "Developing new routine for background subtraction in two-dimensional coincidence Doppler broadening spectroscopy"

58th Electronic Materials Conference (EMC)

Jun 2016

University of Delaware, Newark, DE, USA

Oral talk "High-Sensitivity Measurements of Defects in ZnO by Means of Digital Coincidence Doppler Broadening of Positron Annihilation Spectroscopy"

Annual Spring Meeting of the APS Ohio-Region

Apr 2016

University of Dayton, Dayton, OH, USA

Oral talk "Identification of chemical environment of defects in ZnO by means of digital coincidence Doppler broadening of positron annihilation radiation"

Ohio Inorganic Weekend

Nov 2015

Bowling Green State University, OH, USA

Poster "Approaching Structural Defect Characterization and their Chemical Identification by Means of Coincidence Doppler Broadening of Annihilation Radiation"

41st Polish Seminar on Positron Annihilation (PSPA-13)

Sep 2013

Maria Curie-Sklodowska University, Lublin, Poland

Oral talk "Application of positron spectroscopy for detection of nanostructures in alcohol—aqueous mixtures"

Professional Networks

- Find examples of my code [on GitHub](#) (50+ repositories).

- Discover my professional contacts [on LinkedIn](#) (200+ connections).
- Skim through the list of my publications [on Google Scholar](#) (24 articles, 300+ citations).
- Check out my UI and UX design portfolio [on Dribbble](#) (50+ shots).

Relevant Interests

- Hosting an open-source project for keyboard remapping on Linux [300+ stars on GitHub](#).
- Developed a persistent [RAMDisk plugin](#) for Linux that provides 50% increase in source code indexing time.
- Created two shared libraries for the ROOT data analysis framework [[1](#), [2](#)].